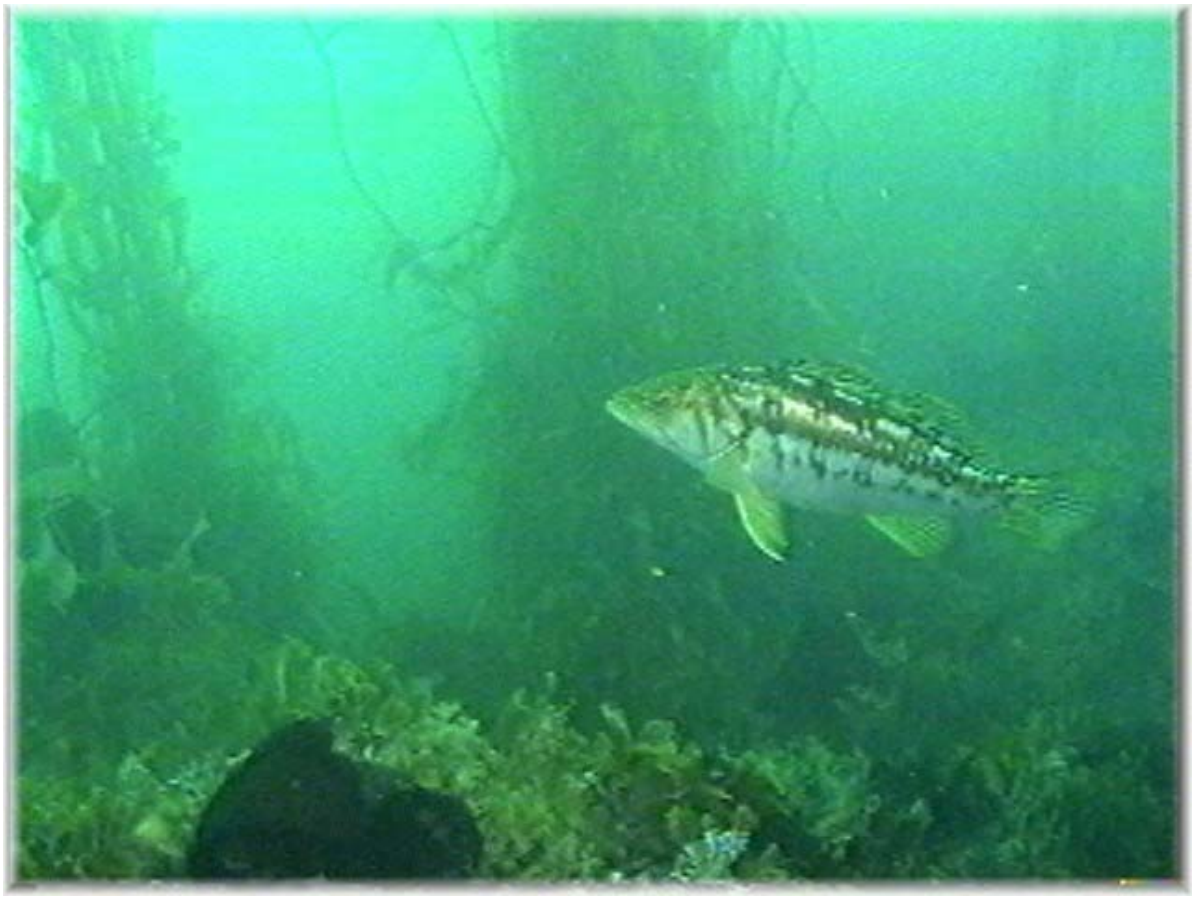
APPENDIX D
2002 MARINE BIOLOGICAL SURVEY

2002 Marine Biological Survey
ExxonMobil Rincon Piers Caissons



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Introduction

The Seacliff Pier Complex (Seacliff) originally was a of series of pile-supported oil and gas production piers that extended from the shoreline south and west from the Seacliff area of Ventura County (see Figure 1). From December 1997 through September 1998 the four piers, five attached wharves, and four concrete caissons were removed. Removal of the caissons necessitated the use of explosives that subsequently resulted in "mounds" of concrete rubble remaining on the seafloor at the four locations. In June 1999, divers located and removed steel debris around and within the rubble mounds and also completed a video-documentation of the condition of remnant caissons and biota associated with the concrete rubble.

Following a review of Padre Associates, Inc. (Padre), 1999, the California State Lands Commission requested that the Seacliff owners/operators, Mobil Exploration Production, Inc. and the Rincon Island Limited Partnership, complete a more detailed survey of the marine habitats and biota associated with the concrete rubble mounds. L. A. de Wit, Consultant completed that survey in September 1999 and prepared a technical report (L. A. de Wit, Consultant, 1999) on the results of that survey and provided an accompanying videotape.

In support of a proposed permit amendment and supporting CEQA environmental review L. A. de Wit, Consultant was contracted by Padre to conduct a follow-up dive survey to collect data on the habitat and biota at the remnant concrete rubble mound sites. Data collected during this survey was to be discussed in a technical report and, where possible, compared to data collected in 1999. The survey was scheduled to be completed over a two-day period in early October 2002.

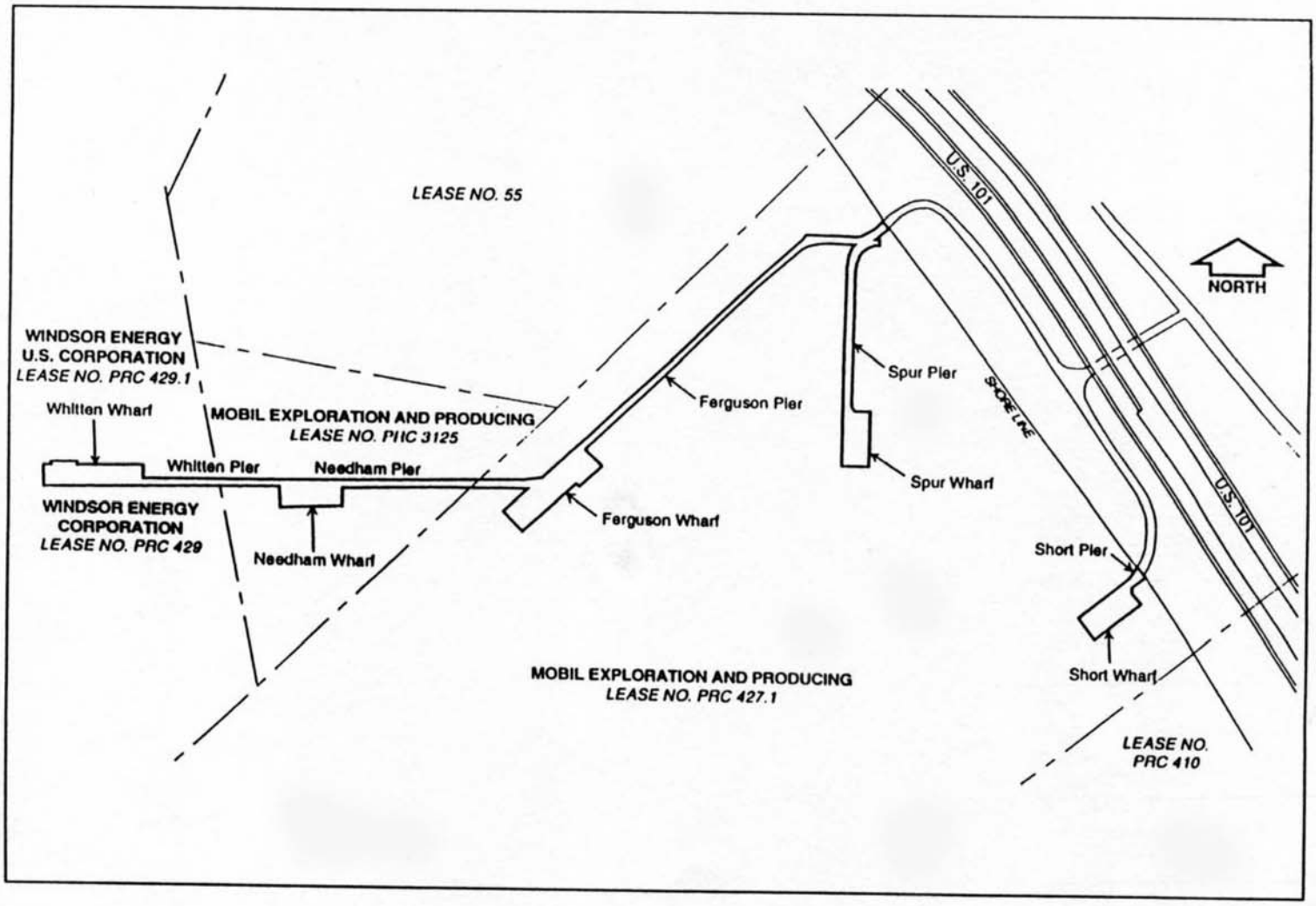
Previous Relevant Studies

In July 1998, during to the removal of the Seacliff pier complex, a marine biological survey was conducted within 16 proposed barge anchor corridors and at a control site located approximately 152 m (500 ft) northwest of the end of Whitten Wharf (L. A. de Wit, Consultant, 1998). The habitats observed by diver-biologists during that survey ranged from silty-clay sediments to high- (1 to 3.3 m [3.0 to 10.0 ft]) relief solid substrate features, with most of the seafloor inshore and offshore of the piers either sediment (sand inshore and silts offshore), or mixed sediment and low- (<0.5 m [<1.5 ft]) to medium- (0.5 to 1.0 m [1.5 to 3.0 ft) relief boulders. Shale ridges 0.1 to 0.3 m (0.3 to 1.0 ft) high were present inshore of the piers and two high-relief rock areas were observed southeast of Ferguson Wharf and northeast of Whitten Wharf. These features supported sea fans, genus *Muricea*, and the colonial anemone *Corynactis californica.*

The 1998 survey report also indicated that the biota associated with the low-relief solid substrate was dominated by leafy red algae, hydroids, and the sand castle worm, *Phragmatopoma californica* (L. A. de Wit, Consultant, 1998). Higher relief features supported sea fans, *Muricea* spp., solitary tunicates, urchins, and sea stars, however none of the macroepifauna species observed were considered abundant.

The 1999 post-demolition marine biological survey report indicates that the rubble mounds were 0.3 to 2.1 m (1 to 7 ft) above the surrounding sedimentary bottom, in approximately 20 to 25-feet water depths, and consisted of layers of irregularly-shaped concrete pieces up to 1.0 m (approximately 3 ft) across. Most of the natural seafloor around the four rubble sites was sedimentary (sand to silty sand) with isolated low-relief boulders and ridges. All of the rubble mounds supported kelp, *Macrocystis* sp., although it was most abundant at the two higher-relief Whitten sites where it formed a relatively small surface canopy.

Common macroepifauna observed at the rubble mound sites during the 1999 survey included three sea stars, *Pisaster ochraceus, P. giganteus,* and the less common *P. brevispinus*, the solitary tunicate *S. montereyensis*, a sea cucumber, *Parastichopus parvimensis*, and the key-hole limpet, *Megathura crenulata.* Although not common, urchins and spiny lobster, *Panulirus interruptus* were occasionally observed at the Whitten sites, but were not found at the either of the inshore (Needham and Ferguson) sites (L. A. de Wit, Consultant, 1999).



Source: Padre Associates, 1999.

Figure 1
Original Configuration of ExxonMobil Rincon (Seacliff) Pier Complex and Locations of Caisson Rubble Survey Dive Sites

Personnel, Methods, and Equipment

Mr. Ray de Wit of L. A. de Wit, Consultant and Mr. Rick Ware of Coastal Resources Management completed the field data collection effort for the follow-up survey on 8-9 October 2002. The M.V. *Solera*, a 30-ft. vessel owned by Solera, LLC of Santa Barbara, California, was used as a dive-support boat. Mr. Dominic Lanewicz operated the boat during the dive survey, and Mr. Mike Weber was an onboard observer from Padre.

Fugro West provided locations of the four rubble mound sites (see Table 1); in the field, and each was located by the onboard GPS system and fathometer. In order to compare the rubble-associated biota with that found on natural rock features, the same high relief control site used in the 1998 and 1999 surveys was also surveyed.

Table 1
Locations of Concrete Rubble Sites

Site	Latitude	Longitude	Depth (Ft., MLLW)[1]
Whitten West	34° 21.010'	119° 26.08'	24 to 19
Whitten East	34° 21.010'	119°26.05'	24 to 20
Needham	34°20.99'	119°25.97'	24 to 22
Ferguson	34°21.00'	119°25.84'	21 to 20

[1] As recorded from diver's depth gauges.

Descriptions of the habitat and biota observed at each site and a comparison of the resources observed during this survey with that observed in 1999 are provided below. The original configuration of the Seacliff piers and wharves and the rubble mound survey sites are shown in Figure 1.

Utilizing the onboard navigation and bathymetric systems, each dive site was located and a temporary buoy was deployed prior to initiating the dives. The diver-biologists entered the water and confirmed the presence of the expected habitat. The team then swam north-south and east-west transects over the target, recording habitat type, water depth, and the relative abundance of macroepibiota. Along each transect, some concrete pieces were overturned to ascertain if juvenile abalone were present; all overturned rubble was returned to its original position following the observations. The estimated size of the holdfast and number of stipes of representative kelp plants within each transect was also recorded. After completing those transects, the diver-biologists swam around the base of each rubble mound and recorded habitat and biological observations within the ecotone habitat (interface between the rubble and natural sedimentary/rock bottom). The size of each of the four rubble mounds was measured, and video footage and still photographs were taken along each transect.

Results and Discussion

Weather throughout the survey was generally clear, although low clouds and fog persisted during the late morning hours of 8 October. Winds were light and variable and the water temperature on the seafloor ranged from 58 to 63°F; no distinct thermocline was found at any of the sites. A 1 to 3-ft. southwesterly swell prevailed throughout the survey period; underwater visibility ranged from 0.6 to 3.0 m (2 to 10 ft) with clearest water conditions at the Whitten sites.

Collected data consisted of diver-biologists' observations, and video and still photographs within the various habitats at and immediately around each site. Thirteen dives, totaling 4.0 hours, were completed at the five sites. Approximately 55 minutes of video and 17 underwater photographs were taken. In addition to this report and associated photographs, a videotape that summarizes the conditions observed in 1999 and 2002 was prepared. Still photographs are provided in Plates 1 through 4 at the back of this report.

Surface Observations

Although GPS (latitude/longitude) locations of the four rubble mounds were provided by Fugro West, surficial kelp was present and facilitated locating each site from the survey vessel. The kelp canopy at each of the two Whitten sites was estimated to be 9 m wide and 31 m long (30 ft wide and 100 ft long) thus covering an estimated total area of

approximately 560 m² (6,000 ft²). The kelp canopies at the shallower Ferguson and Needham sites were somewhat smaller, each covering approximately 148 m² (1,600 ft²). Commercial fishing traps were present around the perimeter of each of the rubble mound sites, being most abundant at the two Whitten sites. A harbor seal (*Phoca vitulina*), several California sealions (*Zaolophus californianus*), and a pod of approximately five bottlenose dolphin (*Tursiops truncates*) were observed within the survey area during the two-day survey period.

Habitat Characterization

The natural seafloor habitats around the Seacliff piers sites were a mixture of sediment (sand, silts, and clays) and low-relief solid substrate consisting of isolated boulders and discontinuous shale bedrock ridges. Sediments that surround the higher-relief features range from sand at the inshore sites to silty sand at the deeper-water (Whitten) sites. Similar to previous surveys at the site, the focus of this study was to characterize the macroepibiota associated with concrete rubble and on nearby natural rock substrates. The following discusses the habitats observed at each site; the biota associated with each site is described later in the report.

Concrete Rubble Sites: The caisson rubble consisted of 2.5 cm to 1 m- (1 in. to 3 ft-) diameter concrete pieces and each site was surrounded by silty-sand sediments interspersed with isolated low-relief boulders and ridges. The apices of the rubble mounds were 0.3 to 2.1 m (1 to 8 ft) above the surrounding sedimentary bottom, with the highest mound (Whitten West) being approximately the same height as the nearby natural rock features and the control site reef. The majority of rubble was 2.5 to 30 cm (1 to 12 in.) with the smaller pieces of rubble located in depressions and around the perimeter of the feature. Maximum vertical relief of the caisson rubble mounds, as measured by diver's depth gauges, was close to that noted in Padre Associates, 1999 and by L. A. de Wit, Consultant, 1999. The rubble mound height of each caisson site during this survey was:

Whitten West:	8 feet
Whitten East	5 feet
Needham	3 feet
Ferguson	2 feet

Except at the Ferguson site, the concrete rubble was easily detected from the natural substrate as it differed in color (gray) and texture (sharp angles) from the predominantly brown sediments and the sediment-covered natural rock substrate. Although the main portion of the remnant caisson was visible, much of the rubble around the outer perimeter at the Ferguson site had apparently been covered with sediment. Using a plastic tape, diver-biologists measured the dimensions of each of the rubble mounds along the two transects (north-south and east-west). Those measurements indicate that each of the Whitten mounds covers approximately 400 m² (4,300 ft²), while rubble at the Needham and Ferguson sites cover approximately 290 m² (3,120 ft²) of the seafloor.

High-Relief Control Site: Rising approximately 2 m (6 ft) above the surrounding sedimentary seafloor, the habitat at the high-relief control site is made up of rock ridges separated by sediment-and cobble-filled depressions. Isolated sediment-covered boulders up to 1.3 m (4 ft) in diameter were present around the base of the feature.

Epibiota and Fish Communities

Concrete Rubble Sites: The understory flora comprises various red algae including species of *Gigartina,* c.f. *Halymenia,* and *Iridophycus*. Juvenile and adult kelp plants were common to abundant, and distinct surface canopies were observed at all four of the caisson sites (see above for canopy sizes). Another brown alga, *Desmarestia munda* was also common at the Whitten sites and locally abundant at the Needham and Ferguson sites. Juvenile and subadult kelp plants were common at the two Whitten sites, and the largest kelp plants had holdfasts measuring up to 1 m in diameter; the largest kelp plants were generally attached to larger pieces of the rubble.

The macroepifauna at the caisson sites was relatively depauperate, dominated by hydroids and seastars, while the macroepifauna associated with the natural rock that interspersed the rubble was more diverse and was characterized by the colonial hydroid *Aglaophenia* sp., two species of the sea fan genus *Muricea*, and the colonial tunicate *Cystodytes*

lobatus. Kelp was also common on the natural rock. Although suitable habitat appears to exist in the area, no abalone were observed at the four rubble mound sites or on surrounding natural rocky features.

The demersal (bottom-oriented) ichthyofauna at the Whitten sites was characterized by the barred sand bass, (*Paralabrax nebulifer*), while water column taxa included aggregations of white surfperch (*Phanerodon furcatus*), black perch (*Embiotoca jacksoni*), senorita (*Oxyjulis californica*), kelp bass (*Paralabrax clathratus*), and juvenile olive rockfish, (*Sebastes serranoides*). A single brown rockfish (*Sebastes auriculatus*) was observed at the Whitten west site. Except for the juvenile olive rockfish, the inshore rubble mound sites supported a similar fish, community, however fewer individuals were observed at the Needham and Ferguson sites than at the Whitten sites.

Control Site: Kelp and the red algae observed at the rubble mounds were also abundant at this site, however understory algae were less abundant, particularly under the kelp canopy. Common invertebrate taxa associated with the high-relief control site included the aforementioned colonial tunicate *Cystodytes*, the colonial hydroid *Aglaophenia*, and the sea fan *Muricea* spp. Fish, including barred sandbass, kelp bass, and white surfperch were present but not as abundant as at the rubble sites. Only two red urchins, *Strongylocentrotus franciscanus* were observed within the area surveyed at the natural reef site and no abalone were observed at the control site.

Comparison with Previous Surveys

Most of the 46 marine taxa recorded at the rubble mound sites during the 1999 survey were observed during the 2002 survey. Changes or similarities in the habitat and biota between the two surveys are listed below and Table 2 lists the relative abundance of macroepibiota recorded during the 1999 and 2002 surveys.

- The exposed portions of concrete rubble appear to cover about the same area of seafloor and the habitat is stable. Although some of the rubble at the inshore sites was covered with sediment, the amount of exposed rubble has not changed substantially since the 1999 survey, indicating the material is relatively stable and withstands storm-generated wave forces.
- The area of the surface kelp canopies was substantially larger and the relative subsurface kelp density at all sites had increased over the three-year period between the two surveys. In 1999, the surface canopy was relatively small (Whitten sites) or not present (Needham and Ferguson sites), however in 2002 it was obvious at all four rubble mound sites. The kelp canopy at each of the offshore sites covered approximately 280 m^2 (3,000 ft^2) in 2002 compared to an estimated surface area of 37 m^2 (400 ft^2) in 1999.
- Compared to the 1999 survey, the colonial hydroid *Aglaophenia* sp. was more abundant on the natural rock during the most recent survey.
- Substantially fewer urchins were observed at the high relief control site during the 2002 survey compared to the 1999 observations.
- The stalked tunicate *Styela montereyensis* was less abundant on the natural rock and concrete rubble during the 2002 survey.
- No sea cucumbers *Parastichopus* spp. were observed during the 2002 survey; they were noted as "present" at all four of the rubble mound sites in 1999.
- Rock crabs, *Cancer* spp., were less abundant at the rubble sites in 2002 compared to 1999 observations.
- The sandcastle worm, *Phragmatopoma californica*, was not observed during the 2002 survey and sediment cover of the rubble at the Ferguson site had increased over 1999 observations.
- Understory algal diversity and abundance noted during the 2002 survey appeared to have increased since 1999 at all four rubble mound sites.

Table 2
Relative Abundance of Macroepibiota Recorded During the 1999 and 2002 Surveys

Species	Survey Sites				Notes
	Rubble Mounds 1999	Rubble Mounds 2002	Control Site 1999	Control Site 2002	
Algae					
Acrosorum venulosum	u-c[1]	p	c-a	p	
Desmarestia ligulata	p-loc c	c	p-loc c	p	Present at all sites.
Gigartina californica	p	p	p	no	
G. canaliculata	p	no	p	no	
c.f. *Iridophycus* sp.	p	p-c			
Lithothamnion/Lithophyllum			p-c	p	
Macrocystis sp.	p-a	p-a	a	c-a	Formed canopy at sites.
c.f. *Rhodymenia* sp.			c-a	p	
Ulva spp.	p	no			Only on inshore sites.
Unid. filamentous red algae	p-c	p-c	c-a	c-a	
Cnidaria					**Hydroids, Jellyfish, Corals**
Anthopleura elegantissima			p	p	
Muricea californica/fruticosa	p	p-loc a	p	p	Only on natural rock.
Unid. hydroids	p	p	p	p	
Annelida					**Worms**
Phragmatopoma californica	loc. a	no			Only on inshore sites.
Salmacina tribranchiata			p-c	p	
Mollusca					**Clams, Snails, Nudibranchs**
Cypraea spadicea	p	no	c	no	
Flabellonopsis iodinea			p	no	
Kelletia kelletii	u	u	p	p	
Megathura crenulata	u	p	p	p	
Mitra idea			u	no	
Echinodermata					**Seastars, Urchins**
Asterina miniata	no	p	p	p	
Parastichopus parvimensis	p	no	p	no	
Pisaster brevispinus	u-p	u			
P. giganteus	u-p	p			
P. ochraceus	p-loc a	p	p	p	
Strongylocentrotus franciscanus	u-p	no	c-a	u	
S. purpuratus			loc c	no	
Unid. ophiuroids			u	no	
Arthropoda					**Crabs, Lobster, Shrimp**
Cancer productus	p-loc a	p			
Loxorhynchus crispatus	u	no			
L. grandis	p	u			
Panulirus interuptus	p	no	p	no	
Urochordata					**Sea Squirts, Tunicates**
c.f. *Chelosoma sp.*	p-loc a	p			
Cystodytes lobatus	p	p-c	p	p	On natural rock only.
Styela montereyensis	p-loc a	p-c	c	p	
Pisces					**Fish**
Damalichthys vacca	p-c	p	p	no	
Embiotoca jacksoni	p-a	p	p	p	
Myliobatis californica	u	no			

Table 2 (Con't)	Rubble Mounds 1999	Rubble Mounds 2002	Control Site 1999	Control Site 2002	Notes
Pisces					**Fish**
Oxyjulis californica	no	p-c	p	p	
Oxylebius pictus			p	no	
Paralicthys californicus	p	p			
Parlabrax clathratus	u-p	p	p	p	
P. nebulifer	u-c	c	p	p	
Phanerodon furcatus	u-a	p	p	p	
Sebastes auriculatus (juveniles)		p		p	
S. serranoides (juveniles)	p	p-c	p	p	
Unid. juvenile rockfish	p	p			

[1]u = uncommon, p = present, c = common, a = abundant, no = not observed (used only when organism was observed only during one of the surveys).

Summary of Findings

The four rubble mounds continue to provide substantial amounts of moderate to high-relief habitat that augments the limited natural rock substrate in the area. Despite the apparent absence of abalone in the local area, the habitat created by the rubble appears to be suitable to support abalone, and it does support a macroflora characteristic of a southern California kelp bed community with *Macrocystis* sp. dominating the floral components. Understory algal species, including *Desmarestia* and several red algal taxa, are abundant and juvenile and subadult-size kelp plants are common at all of the rubble sites.

The rubble-associated epifauna differs somewhat from that found on the natural rock habitat in that sea fans, *Muricea* spp., have not yet established on the former, but are common to locally abundant on the later. The rubble habitat, particularly at the center, highest-relief portion of each site, provides substantial microhabitats for cryptic organisms and multiple attachment points for flora and epifauna. The holdfasts of the kelp plants at the site were healthy and measured up to 1 m (3 ft) in diameter, covering some smaller rubble pieces around the perimeter of each site.

Commercial crab and/or lobster trapping activities continue around and on the rubble habitat and while rock crabs and lobster were not commonly observed during the 2002 survey, the habitat appears to be conducive to those species.

References

L. A. de Wit, Consultant, 1998. *Marine Habitats and Biological Resources in the Area of Proposed Barge Anchoring Offshore Ventura County, California.* Prepared for Padre Associates, July 8, 1998. Job Number 98-005.

L. A. de Wit, Consultant, 1999. *Seacliff Pier Caissons Post-Demolition Marine Biological Survey.* Prepared for Padre Associates, September 1999. Job Number 99-013.

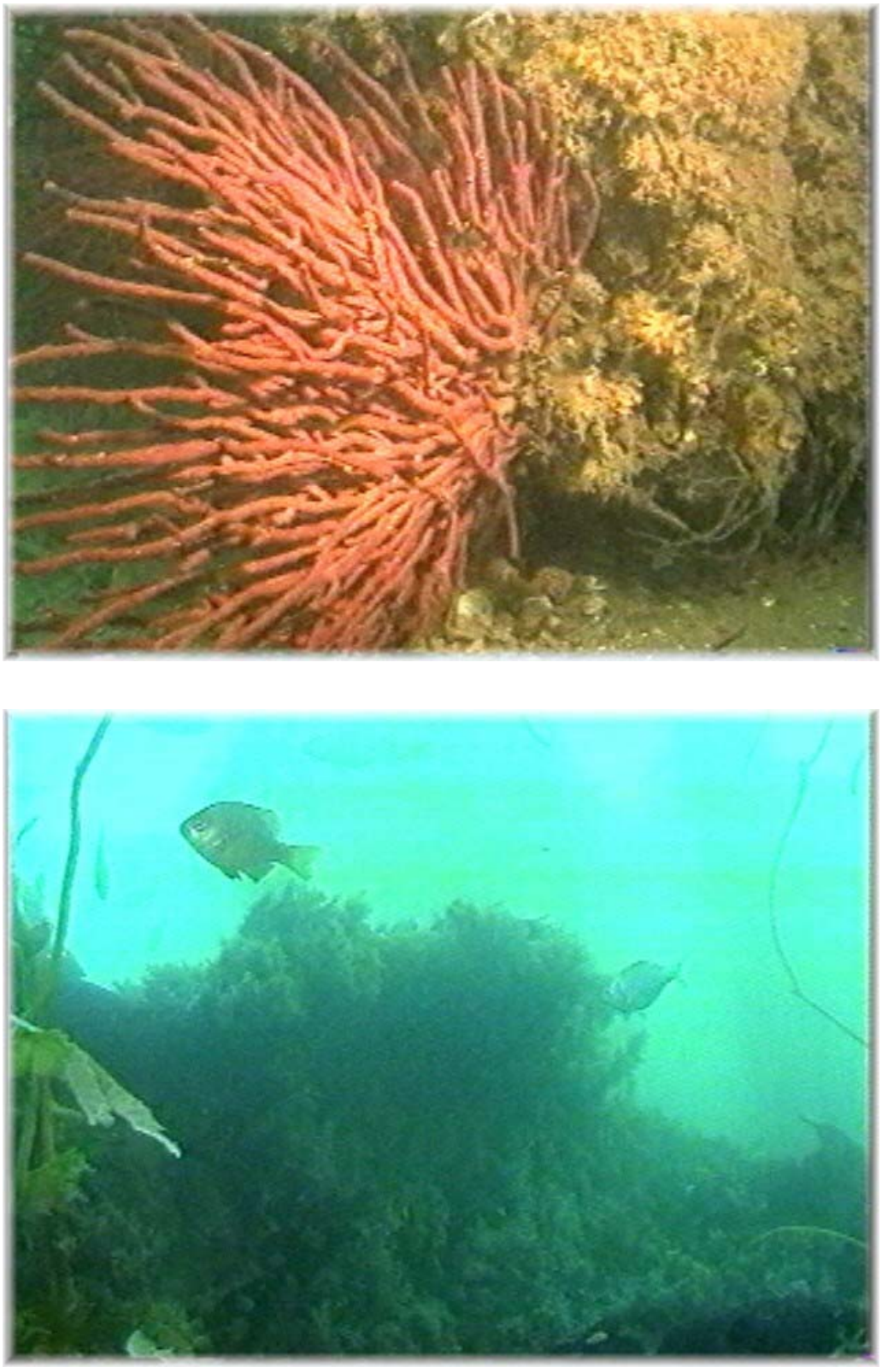
Padre Associates, Inc., 1999. *Final Mobil Seacliff Pier Complex Debris Survey and Removal Report.* Prepared for Mobil Exploration and Producing U.S., Inc. and Rincon Island Limited Partnership, July 9, 1999. Project Number 9702-0102.

Typical Scattered Concrete Rubble, Whitten, Ferguson, and Needham Sites

PLATE 1

Macrophytic Algae on Concrete Rubble

PLATE 2



Typical Epibiota and Fish on Natural Rock Habitat

Juvenile and Adult Kelp and Typical Fish Associated with Concrete Rubble

PLATE 4